

CLAIMS

1. A speaker comprising a diaphragm, wherein
the diaphragm is a injection-molded product made of a
5 mixture containing a resin material and a fiber material.
2. The speaker of claim 1 further comprising a dust cap
attached to the diaphragm, wherein
the dust cap is an injection-molded product made of a
10 mixture containing the resin material and the fiber material.
3. The speaker of claim 1, wherein
the resin material is a crystalline olefin resin or an
amorphous olefin resin.
- 15 4. The speaker of claim 1, wherein
the resin material is one of polypropylene and
engineering plastic.
- 20 5. The speaker of claim 1, wherein
the fiber material contains at least one of wood fiber,
leaf fiber, bast fiber, seed fiber, fruit fiber, stem fiber and
animal fiber.
- 25 6. The speaker of claim 5, wherein

the wood fiber contains at least one of craft pulp and sulfite pulp.

7. The speaker of claim 1, wherein

5 the mixture is added with reinforcement.

8. The speaker of claim 1, wherein

the fiber material has a fiber length of 0.2 mm to 20 mm.

10 9. The speaker of claim 1, wherein

the mixture contains 5% to 70% in weight of the fiber material.

10. The speaker of claim 2, wherein

15 one of the diaphragm and the dust cap is black or natural color.

11. The speaker of claim 2, wherein

20 one of the diaphragm and the dust cap includes the resin material and the fiber material, which are different in color from each other.

12. The speaker of claim 11, wherein

25 one of the diaphragm and the dust cap includes the resin material, which is transparent or semi-transparent.

13. A diaphragm for speakers, the diaphragm being an injection-molded product made of a mixture containing a resin material and a fiber material.

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14. The diaphragm of claim 13, wherein
the resin material is a crystalline olefin resin or an amorphous olefin resin.

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15. The diaphragm of claim 13, wherein
the fiber material contains at least one of wood fiber, leaf fiber, bast fiber, seed fiber, fruit fiber, stem fiber and animal fiber.

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16. The diaphragm of claim 13, wherein
the mixture is added with reinforcement.

17. The diaphragm of claim 13, wherein
the fiber material has a fiber length of 0.2 mm to 20 mm.

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18. The diaphragm of claim 13, wherein
the mixture contains 5% to 70% in weight of the fiber material.

25 19. The diaphragm of claim 13, wherein

the diaphragm is black or natural color.

20. The diaphragm of claim 13, wherein

the diaphragm includes the resin material and the fiber
5 material, which are different in color from each other.

21. The diaphragm of claim 20, wherein

the diaphragm includes the resin material, which is
transparent or semi-transparent.

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22. A dust cap for speakers, the dust cap being an
injection-molded product made of a mixture containing a resin
material and a fiber material.

15 23. The dust cap of claim 22, wherein

the resin material is a crystalline olefin resin or an
amorphous olefin resin.

24. The dust cap of claim 22, wherein

20 the fiber material contains at least one of wood fiber,
leaf fiber, bast fiber, seed fiber, fruit fiber, stem fiber and
animal fiber.

25. The dust cap of claim 22, wherein

25 the mixture is added with reinforcement.

26. The dust cap of claim 22, wherein
the fiber material has a fiber length of 0.2 mm to 20 mm.

5 27. The dust cap of claim 22, wherein
the mixture contains 5% to 70% in weight of the fiber
material.

28. The dust cap of claim 22, wherein
10 the dust cap is black or natural color.

29. The dust cap of claim 22, wherein
the dust cap includes the resin material and the fiber
material, which are different in color from each other.

15 30. The dust cap of claim 29, wherein
the dust cap includes the resin material, which is
transparent or semi-transparent.

20 31. Electronic equipment comprising a speaker, wherein
the speaker including a diaphragm and a dust cap, and
the diaphragm and the dust cap are injection-molded
products made of a mixture containing a resin material and a
fiber material.

32. The electronic equipment of claim 31 being equipment mounted on a car.

33. A method for manufacturing one of a diaphragm and a dust
5 cap, the method comprising:

wet mixing a fibrous resin and a filler;

forming a primary composite material by dehydrating a
mixture of the fibrous resin and the filler;

grinding the resin into a granular form;

10 forming a secondary composite material by mixing the
primary composite material with the resin in the granular form;
and

injection molding the secondary composite material.

15 34. The method of claim 33, wherein

the forming of the secondary composite material includes
substituting the resin for moisture.

35. The method of claim 34, wherein

20 the substituting is granulating a mixture of the primary
composite material and the granular resin by drying with heat.

36. The method of claim 33 further comprising:

palletizing the secondary composite material.

25 37. The method of claim 33 further comprising:

adding reinforcement or a diluent resin, the adding being performed during or after the forming of the secondary composite material.

5 38. A device for manufacturing one of a diaphragm and a dust cap, the device comprising:

a device for wet mixing a fibrous resin and a filler;

a dehydrator for dehydrating a mixture of the fibrous resin and the filler, thereby forming a primary composite
10 material;

a grinder for grinding resin into a granular form;

a mixer for mixing the primary composite material and the resin in the granular form, thereby forming a secondary composite material; and

15 an injection molder for molding the secondary composite material.

39. The device of claim 38 further comprising:

a mixer for mixing the secondary composite material and
20 one of a reinforcement-containing resin material and a diluent resin.